Effect of Seismic Load on Behavior of RCC and Composite Structure Analysis using Staad Pro

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Abstract: *This study investigates the comparative behavior of Reinforced Cement Concrete (RCC) and composite structures under seismic loading using STAAD Pro software. With the growing need for efficient and resilient buildings in earthquake-prone regions, understanding the dynamic performance of different structural systems has become essential. The project involves the modeling of an 8-story (G+7) building in two configurations—RCC and composite—while maintaining consistent geometry, loading conditions, and support constraints to ensure an accurate comparison. Seismic loads are applied based on IS 1893:2016 standards, and both static and dynamic (response spectrum) analyses are performed. Key structural parameters such as base shear, story drift, displacement, and natural frequencies are recorded and analyzed. The results highlight significant differences in structural performance, with composite structures generally exhibiting reduced displacements and improved energy dissipation due to the synergistic interaction between steel and concrete. This study not only demonstrates the advantages of composite construction in seismic regions but also emphasizes the importance of advanced structural modeling and dynamic analysis in modern design practices.*

Keywords: Seismic analysis, RCC structures, Composite structures, STAAD Pro, Structural dynamics